REMARKS

Claims 1-13 are pending.

In the Office Action, claims 1-4, 6-10 and 12 were rejected under 35 USC 102(b) as being anticipated by U.S. Patent No. 6,121,619 to Johnsen, et al. ("Johnsen"). Claims 5, 11 and 13 were rejected under 35 USC 103(a) for obviousness in view of Johnsen. These rejections are traversed.

The present invention discloses a photomultiplier tube (PMT) base with an integrated amplifier that operates off of the current provided to dynode stages of the PMT. The integrated amplifier does not use any of the extra gain from the PMT itself and thus does not reduce the limited useable lifetime of the dynode stages. The present amplifier provides pulse amplification and device impedance conversion. By integrating the amplifier with the PMT high voltage divider circuit, the present invention not only reduces power consumption but also improves the signal to noise ratio. Further, because a reduced current can be used, better current stabilization is achieved and the useful life of the dynode stages is extended.

Claim 1, for example, recites "A photomultiplier tube base, comprising: electronic circuitry that provides stable power....for....a photomultiplier tube (PMT); and, an amplifying circuit for amplifying a PMT output signal....wherein, the electronic circuitry and the amplifying circuit are integrated into one replaceable component that receives power from a PMT high voltage divider..."

Johnsen teaches a method and apparatus for predicting when a photomultiplier tube (PMT) in a gamma camera will fail. After a PMT has been predicted to fail, steps can be taken to replace the PMT prior to actual failure. See abstract. The failure prediction method of Johnsen includes the steps of: attaching the apparatus to a gamma camera to be tested; setting the gain of a high voltage amplifier to its maximum value; monitoring each PMT for autotune failure; and, when autotune failure first occurs in a PMT, storing the instantaneous high voltage gain as a failure point for the failed PMT. See column 5, lines 17-22. The apparatus of Johnsen that is attached to gamma cameras includes a plurality of autotune amplifiers 11, a plurality of autotuners 13, a high voltage amplifier 15, and a processor 17. See column 7, lines 12-21, and Figure 1. One autotune amplifier is connected to the output of each PMT in the gamma camera via a plurality of data buses (also referred to as bus cables) 18. See column 7, line 25-26, and column 7, line 67 to column 8, line 2. The autotune amplifiers 11 are connected to the autotuners 13 via databus 38. See column 8, lines

50-51. The autotune amplifiers 11 are also connected to the high voltage amplifier 15 via data lines 36. See column 8, lines 35-43.

Johnsen fails to disclose a PMT base that provides power to the PMT and provides power to an amplifier that is integrated within the PMT base, as recited in claim 1. Johnsen does not even deal with the problem that is solved by the present invention, providing an improved power circuit for individual PMT's. There is no discussion in Johnsen regarding the power source of the PMT's and there is no power circuit for a PMT shown in Johnsen. Page 2 of the Office Action states that detector 10 and processor 17 provide power and gain control to the dynode stages of a PMT. What Johnsen actually teaches is that detector 10 is the entire gamma camera that includes an attenuating boot 12, a collimator 20, a scintillation crystal 22, and a plurality of PMT's collectively referred to by numeral 24. See column 7, lines 15-16 and lines 22-25. Johnsen goes on to explain that detector 10 actually includes sixty-three separate PMT's arranged in nine columns and seven rows. See column 7, lines 52-53. While it is true that detector 10 must include a power circuit for each of its sixty-three PMT's, it is also true that detector 10 is not an individual power circuit that provides stable power to the dynode stages of a single PMT. Johnsen also teaches that processor 17 receives signals from high voltage amplifier 15 and uses these signals to form diagnostic images. See column 8, lines 42-47. In the PMT failure prediction method of Johnsen, processor 17 sets the gain of the high voltage amplifier 15 and monitors databus 40 to determine when any one of autotuners 13 can no longer maintain an associated (minimum) final signal. See column 9, lines 19-23 and 59-65. Processor 17 has nothing to do with providing stable power and gain control for dynode stages of an individual PMT, as asserted on page 2 of the Action.

The Action further states on page 2 that the detector 10, the processor 17, and amplifying circuit 15 are integrated into one replaceable component that receives power from a PMT high voltage divider. This assertion is simply without merit. In gamma cameras, a high voltage divider can be found within each individual PMT supplying power to the multiple dynode stages within the individual PMT. It is impossible for one PMT high voltage divider to supply power to an entire gamma camera (detector 10) that includes sixty-three PMT's, an external computer processor (processor 17), and an amplifying circuit (15) that amplifies the outputs of all sixty-three PMT's of the camera.

The Action still further asserts on page 2 that "the PMT base provides pulse shape enhancement; and the PMT base can be electrically connected to the PMT." As there is no antecedent basis for "the PMT base" on page 2 of the Action, Applicant assumes that detector 10, processor 17 and amplifying circuit 15 are alleged to be the PMT base. This allegation is a factual impossibility. Each of the sixty-three PMT's within detector 10 includes a PMT base, meaning that there are sixty-three PMT bases within the detector 10. To say that each of the sixty-three PMT bases within detector 10 includes detector 10 simply does not make sense. The Action cites figure 1-3 and columns 7-12 of Johnsen in support of these allegations. Figure 1 of Johnsen show a gamma camera with diagnostic apparatus attached. Figure 2 is a flow chart showing the steps in the diagnostic method. And, figure 3 is a table showing exemplary values that are stored by the diagnostic apparatus of Johnsen. In regards to columns 7-12 of Johnsen, a thorough reading of these columns indicate that "PMT bases" are not mentioned or even discussed. Further, the phrases "PMT base" and "high voltage divider" are not even used in the entire patent of Johnsen.

For all of the above reasons, claim 1 is considered allowable over Johnsen. Claims 2-6 depend from claim 1 and are considered allowable for at least the same reasons. Claims 7 recites similar features as claim 1 and is considered allowable for at least the same reasons. Claims 8-13 depend from claim 7 and are considered allowable for at least the same reasons.

All claims are believed to be in condition for allowance, and a Notice to that effect is respectfully requested. If any questions remain, the Examiner is invited to telephone the undersigned at the number listed below.

Respectfully submitted,

By: Auzville Jackson, Jr.

Auzville Jackson, Jr.
Registration No. 17,306

8652 Rio Grande Road
Richmond, Virginia 23229
(804) 740-6828

Date: 10/29/03